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(REV. 3/2001)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

DATE: April 25, 2001

EXPRESS MAIL LABEL NO.
EL483387572USATTORNEY DOCKET NO.
45108/DBP

U.S. APPLICATION NO.

09/830438

INTERNATIONAL APPLICATION NO.
PCT/AU00/01018INTERNATIONAL FILING DATE
August 28, 2000PRIORITY DATE CLAIMED
August 26, 1999TITLE OF INVENTION
INSECTICIDAL COMPOSITION

APPLICANT(S) FOR DO/EO/US

MILGATE, Brian; BASTA, Albert Habib; SPOONER-HART, Robert Neil; and TAYLER, David William

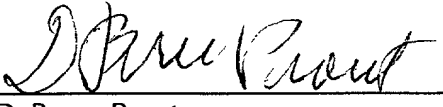
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☐ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/LUS).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (UNEXECUTED)
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 13 to 20 below concern document(s) or other information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ **SMALL ENTITY** Assertion: Applicant(s) and any other associated with it/them under 37 CFR § 1.27(a) are a small entity.
20. ☒ Certificate of Mailing by Express Mail.
21. ☐ Other items or information:

PCT/PTO 25 APR 2001

U.S. APPLICATION NO. (if known, see 37 CFR 1.5) N/A 097/830438		INTERNATIONAL APPLICATION NO. PCT/AU00/01018		ATTORNEY DOCKET NO. 45108/DBP			
21. The following fees are submitted: <input checked="" type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO: \$1,000.00 <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$860.00 <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00 <input type="checkbox"/> International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00 <input type="checkbox"/> International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00				CALCULATIONS		PTO USE ONLY	
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$ 1000			
Surcharge of \$130 for furnishing the oath or declaration later than <input checked="" type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$ 130			
Claims	Number Filed	Number Extra	Rate				
Total Claims	21 -20=	1	X \$18	\$ 18			
Independent Claims	3 -3=	0	X \$80	\$ 0			
Multiple dependent claim(s) (if applicable)			+ \$270	\$ 0			
TOTAL OF ABOVE CALCULATIONS =				\$ 1148			
Reduction by 1/2 for filing by small entity, if applicable. Verified Small entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).				\$ 574			
SUBTOTAL =				\$ 574			
Processing fee of \$130 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$			
TOTAL NATIONAL FEE =				\$ 574			
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				\$			
TOTAL FEES ENCLOSED =				\$ 574			
Note (1): The basic national fee must be paid when filing this application. The 20-month time limit (37 CFR § 1.494) and 30-month time limit (37 CFR § 1.495) are not extendable.				Amount to be:			
				refunded \$			
				charged \$			
a. <input checked="" type="checkbox"/> A check in the amount of \$ 574.00 to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 03-1728 . A duplicate copy of this sheet is enclosed.							
NOTE (2): Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.							
SEND ALL CORRESPONDENCE TO:							
D. Bruce Prout CHRISTIE, PARKER & HALE P.O. Box 7068 Pasadena, CA 91109-7068 CUSTOMER NUMBER: 23363				By  D. Bruce Prout Reg. No. 20,958			

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

EXPRESS MAIL NO. EL483387572US

Applicant : Brian Milgate, et al.
Application No. : N/A
Filed : April 25, 2001
Title : INSECTICIDAL COMPOSITION
Docket No. : 45108/DBP/R178

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Post Office Box 7068
Pasadena, CA 91109-7068
April 25, 2001

Commissioner:

Please amend the above-identified application as follows:

IN THE SPECIFICATION

After the title please add the following:

--CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority of International application number PCT/AU00/01018, filed August 28, 2000, which in turn claims priority to Australian patent application number PQ 2469, filed August 26, 1999--.

IN THE CLAIMS

By this Amendment, Applicants are amending claims 3, 4, 5, 6, 9, 11, 12, 13, 14, 15, 17, 18, 19, 20, and 21. Pending claims 1 to 21 follow.

1. An insecticidal or insect repellant composition including *Tasmannia stipitata* extract and an insecticidally effective oil selected from the group consisting of at least one petroleum oil, at least one vegetable oil, at least one fish oil and mixtures thereof.

2. An insecticidal or insect repellant composition as claimed in claim 1 wherein the *Tasmannia stipitata* extract is included in the composition in an amount of from about 0.01% to about 1.25% w/v, preferably 0.02% to 1.0% w/v, most preferably 0.03% to 0.125% w/v.
3. (Amended) An insecticidal or insect repellant composition as claimed in claim 1 wherein the insecticidally effective oil is included in the composition in an amount of from about 0.25% to about 1.5% w/v, preferably 0.5% to 1.0% w/v.
4. (Amended) An insecticidal or insect repellant composition as claimed in claim 1 wherein the insecticidally effective oil is petroleum oil.
5. (Amended) An insecticidal or insect repellant composition as claimed in claim 1 wherein the insecticidally effective oil is vegetable oil.
6. (Amended) An insecticidal or insect repellant composition as claimed in claim 1 wherein the composition is an emulsion with water.
7. A method of controlling or killing insects comprising exposing an insect population to a composition including *Tasmannia stipitata* extract and an insecticidally effective oil selected from the group consisting of at least one petroleum oil, at least one vegetable oil, at least one fish oil and mixtures thereof.
8. A method as in claim 7 wherein the composition is applied to the insect population by spraying.
9. (Amended) A method as in claim 7 wherein the insect population is resident on a plant or an animal.
10. A method as in claim 9 wherein the insect population is resident on a plant.

11. (Amended) A method as in claimed in claim 7 wherein *Tasmannia stipitata* extract is included in the composition in an amount of from about 0.01% to about 1.25% w/v, preferably 0.02% to 1.0% w/v, most preferably 0.03% to 0.125% w/v.

12. (Amended) A method as claimed in claim 7 wherein the insecticidally effective oil is included in the composition in an amount of from about 0.25% to about 1.5% w/v, preferably 0.5% to 1.0% w/v.

13. (Amended) A method as claimed in claim 7 wherein the insecticidally effective oil is petroleum oil.

14. (Amended) A method as claimed in claim 7 wherein the insecticidally effective oil is vegetable oil.

15. (Amended) A method as claimed in claim 7 wherein the composition is an emulsion with water.

16. Use of *Tasmannia stipitata* extract to enhance the insecticidal activity of an oil selected from the group consisting of at least one petroleum oil, at least one vegetable oil, at least one fish oil and mixtures thereof.

17. (Amended) The use of *Tasmannia stipitata* extract as in claim 16 wherein *Tasmannia stipitata* extract is included in the composition in an amount of from about 0.01% to about 1.25% w/v, preferably 0.02% to 1.0% w/v, most preferably 0.03% to 0.125% w/v.

18. (Amended) The use of *Tasmannia stipitata* extract as in claim 16 wherein the insecticidally effective oil is included in the composition in an amount of from about 0.25% to about 1.5% w/v, preferably 0.5% to 1.0% w/v.

19. (Amended) The use of *Tasmannia stipitata* extract as claimed in claim 16 wherein the insecticidally effective oil is petroleum oil.

20. (Amended) The use of Tasmannia stipitata extract as claimed in claim 16 wherein the insecticidally effective oil is vegetable oil.


21. (Amended) The use of Tasmannia stipitata extract as claimed in claim 16 wherein the composition is an emulsion with water.

REMARKS

Attached hereto is a marked-up version of the changes made to claims 3, 4, 5, 6, 9, 11, 12, 13, 14, 15, 17, 18, 19, 20, and 21 by the current amendment. The attached page is captioned "Version with markings to show changes made."

Respectfully submitted,

CHRISTIE, PARKER & HALE, LLP

By 
D. Bruce Prout
Reg. No. 20,958
626/795-9900

DBP/aam

Docket No. 45108/DBP/R178

VERSION WITH MARKINGS TO SHOW CHANGES MADE

3. Amended) An insecticidal or insect repellant composition as claimed in claim 1 ~~or claim 2~~ wherein the insecticidally effective oil is included in the composition in an amount of from about 0.25% to about 1.5% w/v, preferably 0.5% to 1.0% w/v.
4. (Amended) An insecticidal or insect repellant composition as claimed in ~~any one of claim 1 to 3~~ claim 1 wherein the insecticidally effective oil is petroleum oil.
5. (Amended) An insecticidal or insect repellant composition as claimed in ~~any one of claims 1 to 3~~ claim 1 wherein the insecticidally effective oil is vegetable oil.
6. (Amended) An insecticidal or insect repellant composition as claimed in ~~any one of claims 1 to 5~~ claim 1 wherein the composition is an emulsion with water.
9. (Amended) A method as in claim 7 ~~or claim 8~~ wherein the insect population is resident on a plant or an animal.
11. (Amended) A method as in claimed in ~~any one of claims 7 to 10~~ claim 7 wherein *Tasmannia stipitata* extract is included in the composition in an amount of from about 0.01% to about 1.25% w/v, preferably 0.02% to 1.0% w/v, most preferably 0.03% to 0.125% w/v.
12. (Amended) A method as claimed in ~~any one of claim 7 to 11~~ claim 7 wherein the insecticidally effective oil is included in the composition in an amount of from about 0.25% to about 1.5% w/v, preferably 0.5% to 1.0% w/v.
13. (Amended) A method as claimed in ~~any one of claim 7 to 12~~ claim 7 wherein the insecticidally effective oil is petroleum oil.

14. (Amended) A method as claimed in ~~any one of claim 7 to 12~~ claim 7 wherein the insecticidally effective oil is vegetable oil.

15. (Amended) A method as claimed in ~~any one of claims 7 to 14~~ claim 7 wherein the composition is an emulsion with water.

17. (Amended) The use of Tasmannia stipitata extract as in claim 16 wherein Tasmannia stipitata extract is included in the composition in an amount of from about 0.01% to about 1.25% w/v, preferably 0.02% to 1.0% w/v, most preferably 0.03% to 0.125% w/v.

18. (Amended) The use of Tasmannia stipitata extract as in claim 16 ~~or claim 17~~ wherein the insecticidally effective oil is included in the composition in an amount of from about 0.25% to about 1.5% w/v, preferably 0.5% to 1.0% w/v.

19. (Amended) The use of Tasmannia stipitata extract as claimed in ~~any one of claim 16 to 18~~ claim 16 wherein the insecticidally effective oil is petroleum oil.

20. (Amended) The use of Tasmannia stipitata extract as claimed in ~~any one of claims 16 to 18~~ claim 16 wherein the insecticidally effective oil is vegetable oil.

21. (Amended) The use of Tasmannia stipitata extract as claimed in ~~any one of claims 16 to 20~~ claim 16 wherein the composition is an emulsion with water.

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INSECTICIDAL COMPOSITION

Technical Field

The present invention relates to an insecticidal composition including *Tasmannia stipitata* extract and insecticidally effective oils such as petroleum oils, vegetable oils and/or fish oils. The invention also relates to a method of controlling arthropods pests using combinations of *Tasmannia stipitata* extract and insecticidally effective oils such as petroleum oils, vegetable oils and/or fish oils.

Background Art

The genus *Tasmannia* was formerly known as *Drimys*. *Tasmannia stipitata* (also known previously as *Tasmannia aromatica* var. *pendunculata* or *Drimys aromatica*) is commonly known as Dorrigo Pepper. It is rich in the compound polygodial.

Polygodial is used in foods for its hot and spicy taste. It also has been found to have antifungal, antibacterial and insecticidal activity.

The active ingredients of *Tasmannia stipitata* appear to be contained within oil cells concentrated in new leaves, new stems and berries. Extracts of leave, stems and berries include polygodial as well as linalool, pinene, copaene, caryophyllene and bicyclo-germacrene.

Petroleum oils (or mineral oils) are used as insecticides. Certain vegetable oils also have insecticidal activity. The most common is canola oil (rapeseed oil). Sesame oil is also used. Other vegetable oils having insecticidal activity include mustard oil. A third group of oils having insecticidal activity is fish oil.

Disclosure of Invention

Combinations of *Tasmannia stipitata* extract and petroleum oil or insecticidally effective vegetable oil have been found to have unexpected synergistic activity as insecticides. It is assumed that the insecticidal activity of fish oils would be similarly enhanced in combination with *Tasmannia stipitata* extract.

Accordingly, the present invention provides an insecticidal or insect repellant composition including *Tasmannia stipitata* extract and an insecticidally effective oil selected from the group consisting of at least one petroleum oil, at least one vegetable oil, at least one fish oil and mixtures thereof.

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In addition to insecticidal activity, the composition acts as an insect repellent. It has also been found that insects that come into contact with a surface that has been treated with the composition exhibit reduced feeding and oviposition (egg laying) behaviour. The composition may therefore be used to control insects.

In another aspect, the present invention provides a method of controlling or killing insects comprising exposing an insect population to a composition including *Tasmannia stipitata* extract and an insecticidally effective oil selected from the group consisting of at least one petroleum oil, at least one vegetable oil, at least one fish oil and mixtures thereof.

In a further aspect, the present invention provides for the use of *Tasmannia stipitata* extract to enhance the insecticidal activity of an oil selected from the group consisting of at least one petroleum oil, at least one vegetable oil, at least one fish oil and mixtures thereof.

The extract of *Tasmannia stipitata* is preferably prepared by solvent extraction of new leaves, new stems and berries. The concentration of polygodial in the extract will vary with the relative proportions of leaves, stems and berries extracted and will also vary with season. Concentrations of about 10% or more polygodial are desirable in the extract, preferably about 10-40% and more preferably about 25-38%.

The concentration of *Tasmannia stipitata* extract in the insecticidal composition may range from about 0.01% w/v to about 1.25% w/v, preferably 0.02% w/v to 1.0% w/v, more preferably 0.03% w/v to 0.125% w/v. The desired concentration will vary with the polygodial content of the *Tasmannia stipitata* extract.

The concentration of insecticidally effective oil in the insecticidal composition may range from about 0.25% w/v to about 1.5% w/v, preferably 0.5% to 1.0% w/v.

Although it will be appreciated that the composition of the invention may be applied to insect populations in a variety of ways, spraying is one preferred means. Application of a spray may be achieved using aerosols, suitably pressurised dispensers or other pumping devices.

Insects of course reside in a variety of environments. For those environments that are animate, such as in the case of plants and animals that are infested with insects, the present invention is advantageous in that it has

reduced toxicity. This arises out of the fact that due to enhanced insecticidal activity, less active material need be applied to the plant or animal.

Modes for Carrying Out the Invention

Materials

- 5 1. Samples of *Tasmannia stipitata* extract (hereinafter referred to as "stipitata extract") were prepared by solvent extraction of mixtures of new leaves, new stems and berries of *Tasmannia stipitata*. These samples contained an average of 27.6% polygodial. The polygodial content of the samples was ascertained as follows:

10 A known weight of stipitata extract was dissolved in 5 mL of ethanol with an internal standard of tridecane at a concentration of 2mg/mL. This solution was analysed by gas chromatography and the polygodial was assessed by area ratio to the tridecane and assumption that the response factor between the two compounds equals 1. The average percent of

15 polygodial stated above is the average percent of volatiles in the extract.

2. D-C-Tron Plus®, spray oil, supplied by Ampol, active ingredient 839g/L petroleum oil (referred to in the tables as "Petroleum Oil 2").

3. Fasta® oil, supplied by Cobbett Pty Ltd, 704 g/L vegetable oil, primarily canola oil (hereinafter referred to as "canola oil").

- 20 4. White oil spray, supplied by Yates, active ingredient 820g/L petroleum oil (hereinafter referred to as "white oil" and in the tables as "Petroleum Oil 1").

Process

25 Stipitata extract in amounts shown in column A of the table below was combined with oils B, C or D respectively in amounts as shown below.

	A	B	C	D
Mixtures	Weight of Stipitata extract (g)	Weight of D-C-Tron Plus® (g)	Weight of Canola Oil (g)	Weight of white oil (g)
1	1.25	10	10	10
2	0.625	10	10	10
3	0.3125	10	10	10
4	1.25	5	5	5

Each of these blends was diluted with distilled water in a 100ml volumetric flask to prepare the following mixtures: Stipitata extract(ml) and oil(ml) (1.25 and 10), (0.625 and 10), (0.3125 and 10) and (1.25 and 5) per 100ml dilution.

From these homogenised stock solutions, further serial dilutions to (0.125 and 1), (0.0625 and 1), (0.03125 and 1), (0.125 and 0.5), (0.0625 and 0.5) and (0.03125 and 0.5) per cent were prepared by mixing the required amount of the stock solution in distilled water.

For Stipitata extract alone, one gram was dissolved in 20ml of absolute ethanol and distilled water was added to prepare a 1% stock solution. A drop weighing 40mg Triton X-100® surfactant supplied by Union Carbide Chemicals and Plastic Co, was added to the stock solution. Further serial dilutions of 0.01, 0.02, 0.04, 0.06 and 0.08% were prepared by mixing the required amount of stock solution with distilled water.

For each oil alone a 10% w/v emulsion in distilled water and further dilutions of 2.0, 1.8, 1.6, 1.4, 1.2, 1.0, 0.50 and 0.25% were prepared by adding to the required amount of distilled water.

Adult female two-spotted mite (*Tetranychus urticae*) were collected. Tests were conducted on 80 females for each treatment, distributed on four French bean leaf discs 25mm diameter, contained in 90mm diameter Petrie dishes. Each treatment was repeated twice.

The leaf discs were placed on moist cotton wool covered with muslin netting.

Water was added to the dish daily to prevent the desiccation of the leaf discs.

The dose of product for testing was applied by means of a Potter Precision Spray Tower and a 5ml aliquot was used for each Petrie dish.

The mortality (number killed) was assessed 24, 48 and 72 hours after treatment. Death was recognised by the absence of movement when the test mites were mechanically stimulated.

Probit analysis based on the concentration of Stipitata extract in the mixtures was carried out to interpret the dose mortality relationship.

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Results

Results are summarised in the tables below.

Product	Spray oil conc %	Time in Hours	LD ₀₅ and 95% Confidence Limits		
			Lower	Median	Higher
Stipitata		24	0.13	0.19	0.3
		48	0.06	0.12 (a)	0.77
Petroleum Oil 2		24	1.75	2.72 (c)	67.06
Petroleum Oil 1		24	2.50	3.04	4.23
		48			
Canola		24	3.85	4.60	5.61
		48	3.41	3.71 (g)	4.47
Petroleum Oil 2 + Stipitata	0.5	24		0.196	
	1.0	24		0.07	
	0.5 (d)	48	0.006	0.048 (b)	0.085
	1.0	48	0.03	0.04	0.06
	0.5	72		0.063	
	1.0	72		0.03	
Canola oil + Stipitata	0.5	24		0.12	
	1.0	24	0.037	0.068	0.325
	0.5	48		0.11	
	1.0 (f)	48		0.08 (e)	
	0.5	72		0.069	
	1.0	72		0.049	

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Product	Spray oil conc %	Time in Hours	LD ₅₀ and 95% Confidence Limits		
			Lower	Medium	Higher
Stipitata		24	0.03	0.03	0.04
		48	0.02	0.03 (t)	0.03
Petroleum Oil 2		24	0.44	1.23 (w)	12.85
Petroleum Oil 1		24	1.23	1.54	1.88
		48			
Canola		24	1.81	2.02	2.34
		48	1.54	1.69 (x)	1.88
Petroleum Oil 2 + Stipitata	0.5	24		0.023	
	1.0	24		0.02	
	0.5 (v)	48	0.001	0.006 (u)	0.011
	1.0	48	0.002	0.01	0.017
	0.5	72		0.016	
	1.0	72		0.01	
Canola + Stipitata	0.5	24		0.03	
	1.0	24		0.01	
	0.5	48		0.02	
	1.0 (z)	48		0.017 (y)	
	0.5	72		0.018	
	1.0	72			0.017

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Combined with all the oils outlined above, *Stipitata* extract was more efficacious (ie. caused higher mortality) than when used alone. In addition, for oils to which *Stipitata* extract had been added, efficacy was significantly enhanced. For oils used alone, mortality was lowest of all treatments.

5 The results above demonstrate synergistic insecticidal effect against Two-spotted mite by *Tasmannia stipitata* extract mixed with different types of oils. The LD₅₀ of *Stipitata* extract alone is improved from 0.12% (a) to 0.048% (b) when blended with 0.5% petroleum oil. Simultaneously the LD₅₀ of petroleum oil is improved from 2.72% (c) to 0.5% (d) with the addition of
10 *Stipitata* extract.

 The LD₅₀ of *Stipitata* extract alone is improved from 0.12% (a) to 0.08% (e) when blended with 1% canola oil (f). Simultaneously the LD₅₀ of canola oil is improved from 3.71% (g) to 1% (f) with the addition of *Stipitata* extract.

 The LD₅₀ of *Stipitata* extract alone is improved from 0.03% (t) to
15 0.006% (u) when blended with 0.5% petroleum oil (v). The LD₅₀ of petroleum oil is simultaneously improved from 1.23% (w) to 0.5% (v) with the addition of *Stipitata* extract. The LD₅₀ of *Stipitata* extract is improved from 0.03% (t) to 0.017% (y) when blended with 1% canola oil (z). The LD₅₀ of canola oil is simultaneously improved from 1.69% (x) to 1% (z) with the
20 addition of *Stipitata* extract

 Synergistic activity as an insecticide against a broad range of insects is expected including thrips, aphids, scales, mites, caterpillars, lice and flies.

Industrial Applicability

 Combining *Tasmannia stipitata* extract with insecticidally effective oils
25 including petroleum oil, vegetable oil, and fish oil gives a highly effective insecticidal composition. The proportion of active ingredients in the composition required for effective control of the insect pest can be substantially reduced compared to the proportion required for each ingredient when used alone. Phytotoxicity of the composition is significantly
30 reduced by reduced actives levels, as is the cost of manufacturing the composition. It is expected that the insecticidal composition will be effective against a broad range of insects.

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It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to
5 be considered in all respects as illustrative and not restrictive.

FOOTNOTES

CLAIMS:

1. An insecticidal or insect repellant composition including *Tasmannia stipitata* extract and an insecticidally effective oil selected from the group consisting of at least one petroleum oil, at least one vegetable oil, at least one fish oil and mixtures thereof.
2. An insecticidal or insect repellant composition as claimed in claim 1 wherein the *Tasmannia stipitata* extract is included in the composition in an amount of from about 0.01% to about 1.25% w/v, preferably 0.02% to 1.0% w/v, most preferably 0.03% to 0.125% w/v.
3. An insecticidal or insect repellant composition as claimed in claim 1 or claim 2 wherein the insecticidally effective oil is included in the composition in an amount of from about 0.25% to about 1.5% w/v, preferably 0.5% to 1.0% w/v.
4. An insecticidal or insect repellant composition as claimed in any one of claim 1 to 3 wherein the insecticidally effective oil is petroleum oil.
5. An insecticidal or insect repellant composition as claimed in any one of claims 1 to 3 wherein the insecticidally effective oil is vegetable oil.
6. An insecticidal or insect repellant composition as claimed in any one of claims 1 to 5 wherein the composition is an emulsion with water.
7. A method of controlling or killing insects comprising exposing an insect population to a composition including *Tasmannia stipitata* extract and an insecticidally effective oil selected from the group consisting of at least one petroleum oil, at least one vegetable oil, at least one fish oil and mixtures thereof.
8. A method as in claim 7 wherein the composition is applied to the insect population by spraying.
9. A method as in claim 7 or claim 8 wherein the insect population is resident on a plant or an animal.

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10. A method as in claim 9 wherein the insect population is resident on a plant.
- 5 11. A method as in claimed in any one of claims 7 to 10 wherein *Tasmannia stipitata* extract is included in the composition in an amount of from about 0.01% to about 1.25% w/v, preferably 0.02% to 1.0% w/v, most preferably 0.03% to 0.125% w/v.
- 10 12. A method as claimed in any one of claim 7 to 11 wherein the insecticidally effective oil is included in the composition in an amount of from about 0.25% to about 1.5% w/v, preferably 0.5% to 1.0% w/v.
13. A method as claimed in any one of claim 7 to 12 wherein the
- 15 insecticidally effective oil is petroleum oil.
14. A method as claimed in any one of claims 7 to 12 wherein the insecticidally effective oil is vegetable oil.
- 20 15. A method as claimed in any one of claims 7 to 14 wherein the composition is an emulsion with water.
16. Use of *Tasmannia stipitata* extract to enhance the insecticidal activity of an oil selected from the group consisting of at least one petroleum oil, at
- 25 least one vegetable oil, at least one fish oil and mixtures thereof.
17. The use of claim 16 wherein *Tasmannia stipitata* extract is included in the composition in an amount of from about 0.01% to about 1.25% w/v, preferably 0.02% to 1.0% w/v, most preferably 0.03% to 0.125% w/v.
- 30 18. The use of claim 16 or claim 17 wherein the insecticidally effective oil is included in the composition in an amount of from about 0.25% to about 1.5% w/v, preferably 0.5% to 1.0% w/v.
- 35 19. The use as claimed in any one of claim 16 to 18 wherein the insecticidally effective oil is petroleum oil.

20. The use as claimed in any one of claims 16 to 18 wherein the insecticidally effective oil is vegetable oil.

- 5 21. The use as claimed in any one of claims 16 to 20 wherein the composition is an emulsion with water.

DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION

PATENT

Docket No. : 45108/DBP/R178

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled INSECTICIDAL COMPOSITION, the specification of which is attached hereto unless the following is checked:

X was filed on August 28, 2000 as United States Application Number or PCT International Application Number PCT/AU00/01018 and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of the foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below, any foreign application for patent or inventor's certificate, or any PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

<u>Application Number</u>	<u>Country</u>	<u>Filing Date (day/month/year)</u>	<u>Priority Claimed</u>
PQ 2469	Australia	26 August 1999	YES

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below.

<u>Application Number</u>	<u>Filing Date</u>
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I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. § 112.

<u>Application Number</u>	<u>Filing Date</u>	<u>Patented/Pending/Abandoned</u>
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POWER OF ATTORNEY: I hereby appoint the following attorneys and agents of the law firm CHRISTIE, PARKER & HALE, LLP to prosecute this application and any international application under the Patent Cooperation Treaty based on it and to transact all business in the U.S. Patent and Trademark Office connected with either of them in accordance with instructions from the assignee of the entire interest in this application;

**DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION**

Docket No. 45108/DBP/R178

or from the first or sole inventor named below in the event the application is not assigned; or from F B RICE & Co. in the event the power granted herein is for an application filed on behalf of a foreign attorney or agent.

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I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION

Docket No. 45108/DBPR178

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